

# Product datasheet

Specifications



EtherCAT motion controller,  
Modicon M310, 8 Axis, 8DI, 8DO,  
Transistor, NPN, EtherCAT,  
Ethernet, RS485

TM310MM25ECT16U

## Main

Range of product	Modicon M310
Product or component type	Motion controller
[Us] rated supply voltage	24 V DC -15...20 %
Discrete I/O number	16
Upstream connectivity	Connected machine to plant

## Complementary

PLC Power Consumption	26 W (100% load) with 25 °C 2.99 W (load free) with 25 °C
Inrush current	50 A
Overvoltage protection	With
Discrete input number	8, discrete input 8 high speed input conforming to IEC 61131-2 type 3
Discrete input voltage	24 V
Discrete input voltage type	DC
Discrete input logic	Sink or source for 2/3-wire proximity sensors PNP/NPN input conforming to IEC 61131-2 type 3
Voltage state 1 guaranteed	$\geq 11$ V for DC
Voltage state 0 guaranteed	0...5 V for DC
Discrete input current	3 mA for high speed input
Response time	$\leq 1$ $\mu$ s turn-on, I0...I7 terminal(s) for fast input $\leq 1$ $\mu$ s turn-off, I0...I7 terminal(s) for fast input $\leq 1$ $\mu$ s turn-on, Q0...Q7 terminal(s) for fast output $\leq 1$ $\mu$ s turn-off, Q0...Q7 terminal(s) for fast output
Configurable filtering time	0 ms for fast input 0.001 ms for fast input 0.002 ms for fast input 0.005 ms for fast input 0.01 ms for fast input 0.05 ms for fast input 0.1 ms for fast input 0.5 ms for fast input 1 ms for fast input 4 ms for fast input 12 ms for fast input
Discrete output number	8 transistor 8 fan output
Discrete output voltage	24 V DC
Discrete output current	0.5 A for fan output (Q0...Q7)
Discrete output type	Transistor
Discrete output logic	Source

<b>Output voltage limits</b>	20.4...28.8 V DC
<b>Maximum current per output common</b>	2 A with Q0...Q7 for fast output
<b>Maximum output frequency</b>	200 kHz
<b>Maximum leakage current</b>	0.3 mA for output
<b>Maximum voltage drop</b>	<1 V
<b>Maximum tungsten load</b>	<1 W
<b>Protection type</b>	Short-circuit and overload protection with automatic reset Reverse polarity protection Short-circuit protection 1 external fuse
<b>Reset time</b>	1000 ms automatic reset fast output
<b>Maximum number of I/O expansion module</b>	7TM3 IO module (local I/O-Architecture) 14TM3 IO module (remote I/O-Architecture) 14TM3 IO module (distributed I/O-Architecture)
<b>Execution time for 1 KInstruction</b>	0.6 ms
<b>Memory capacity</b>	16 MB for user application and data RAM 512 KB flash
<b>Data storage equipment</b>	<= 32 GB SDHC card (optional)
<b>Backup time</b>	2 years at 25 °C (by interruption of power supply)
<b>Battery type</b>	CR2032 1 backup battery optional, battery life: 5 year(s)
<b>Application structure</b>	8 event tasks 8 external event tasks
<b>Realtime clock</b>	Built-in
<b>Cycle time</b>	1 ms 8 EtherCAT
<b>Positioning functions</b>	Libraries axes synchronous function Homing function Jog function CSV function CSP function
<b>Integrated connection type</b>	EtherCAT 1 with RJ45 connector and 100-BASE-TX category 5 or industrial Ethernet interface Ethernet 1 with RJ45 connector and 10/100BASE-T interface Ethernet 2 with RJ45 connector and 10/100BASE-T interface Serial link with removable spring connector connector and RS-485 (isolation) interface USB type C with USB 2.0 connector TM3 IO bus
<b>Communication port protocol</b>	EtherCAT master 100 Mbps EtherNet/IP adapter 10/100 Mbps EtherNet/IP scanner 10/100 Mbps Modbus TCP client/server 10/100 Mbps OPC UA server 10/100 Mbps TCP/UDP master/slave 10/100 Mbps Modbus RTU master/slave 1.2...115.2 kbauds Modbus ASCII master 1.2...115.2 kbauds
<b>Maximum number of connected devices</b>	EtherCAT: 127 line (shielded) Modbus TCP server: 16 (shielded) Modbus TCP client: 64 (shielded) EtherNet/IP scanner: 16 (shielded) EtherNet/IP (adapter): 16 (shielded) OPC UA server: 4 (shielded) Modbus RTU master on RS485: 31 line (shielded, twisted pair cable)

<b>Local signalling</b>	1 LED (green) for PWR (Power Status) 1 LED (green) for RUN 1 LED (red) for ERR (Error) 1 LED (red) for I/O 1 LED (green/yellow) for SD card access (SD) 1 LED (red) for BAT 1 LED (green) for SL1 1 LED (green/red) for ECT 1 LED (green) for ETH1 state 1 LED (green) for ETH2 state
<b>Electrical connection</b>	4-pin removable spring terminal block, 1 terminal(s)for serial communication 3-pin removable screw terminal block, 1 terminal(s)for connecting the 24 V DC power supply
<b>Maximum cable distance between devices</b>	Unshielded cable: <50 m for fast input (normal mode) Shielded cable: <10 m for fast input (HSC mode) Unshielded cable: <50 m for fast output (normal mode) Shielded cable: <3 m for fast output (PLS/PWM/PTO mode) Shielded cable: <100 m for Ethernet network Twisted shielded cable: <1000 m for RS485 link Shielded cable: <3 m for USB 2.0
<b>Insulation</b>	Between supply and ground at 560 V AC Between input and output at 560 V AC Between input and communication at 560 V AC Between input and ground at 560 V AC Between output and ground at 560 V AC
<b>Surge withstand</b>	1 kV power lines (DC) common mode conforming to EN/IEC 61000-4-5 0.5 kV power lines (DC) differential mode conforming to EN/IEC 61000-4-5 1 kV shielded cable common mode conforming to EN/IEC 61000-4-5 1 kV digital I/O common mode conforming to EN/IEC 61000-4-5
<b>Counting input number</b>	8 fast input (HSC mode) at 200 kHz
<b>Control signal type</b>	A/B at 200 kHz for fast input (HSC mode) Pulse/direction at 200 kHz for fast input (HSC mode) Single phase at 200 kHz for fast input (HSC mode)
<b>Mounting support</b>	Top hat type TH35-15 DIN rail conforming to IEC 60715
<b>Height</b>	100 mm
<b>Depth</b>	85 mm
<b>Width</b>	60 mm
<b>Net weight</b>	0.247 kg

## Environment

<b>Standards</b>	IEC 61131-2 IEC/EN 61010-2-201 RoHS REACH
<b>Product certifications</b>	CE
<b>Resistance to electrostatic discharge</b>	6 kV on contact conforming to IEC 61000-4-2 8 kV on air conforming to IEC 61000-4-2
<b>Resistance to electromagnetic fields</b>	12 V/m 80 MHz...1 GHz conforming to IEC 61000-4-3 3 V/m 1.4 GHz...2 GHz conforming to IEC 61000-4-3 1 V/m 2 GHz...3 GHz conforming to IEC 61000-4-3
<b>Resistance to fast transients</b>	2 kV (power lines (DC)) conforming to EN/IEC 61000-4-4 1 kV (digital I/O) conforming to EN/IEC 61000-4-4
<b>Resistance to conducted disturbances</b>	10 V 0.15...80 MHz conforming to EN/IEC 61000-4-6
<b>Immunity to microbreaks</b>	10 ms
<b>IP degree of protection</b>	IP20
<b>Pollution degree</b>	2
<b>Operating altitude</b>	0...2000 m

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<b>Vibration resistance</b>	3.5 mm at 5...8.4 Hz on DIN rail 1 gn at 8.4...150 Hz on DIN rail
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<b>Shock resistance</b>	15 g for 11 ms
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## Packing Units

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<b>Unit Type of Package 1</b>	PCE
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<b>Number of Units in Package 1</b>	1
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<b>Package 1 Height</b>	7.7 cm
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<b>Package 1 Width</b>	10.0 cm
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<b>Package 1 Length</b>	13.1 cm
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<b>Package 1 Weight</b>	286.28 g
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<b>Unit Type of Package 2</b>	S03
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<b>Number of Units in Package 2</b>	18
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<b>Package 2 Height</b>	30 cm
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<b>Package 2 Width</b>	30 cm
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<b>Package 2 Length</b>	40 cm
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<b>Package 2 Weight</b>	5.2 kg
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## Environmental Data

Schneider Electric aims to achieve Net Zero status by 2050 through supply chain partnerships, lower impact materials, and circularity via our ongoing “Use Better, Use Longer, Use Again” campaign to extend product lifetimes and recyclability.

[Environmental Data explained >](#)

[How we assess product sustainability >](#)



### Environmental footprint

Total lifecycle Carbon footprint	1 989 kg CO2 eq.
Carbon footprint of the manufacturing phase [A1 to A3]	107 kg CO2 eq.
Carbon footprint of the distribution phase [A4]	0.2 kg CO2 eq.
Carbon footprint of the installation phase [A5]	0 kg CO2 eq.
Carbon footprint of the use phase [B2, B3, B4, B6]	1 882 kg CO2 eq.
Carbon footprint of the end-of-life phase [C1 to C4]	0.7 kg CO2 eq.
Environmental Disclosure	<a href="#">Product Environmental Profile</a>

### Use Longer



### Lifetime extension

Repair	No
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### Use Again



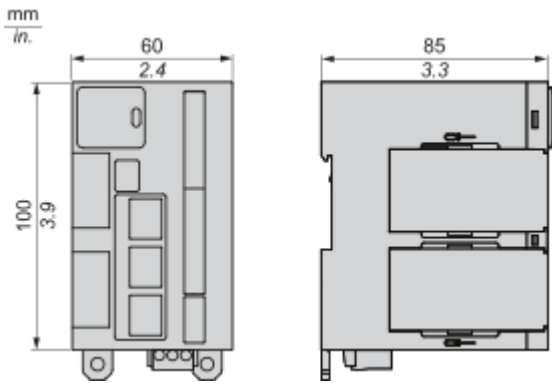
### Repack and remanufacture

Recyclability potential, in %	0
End of life manual availability	<a href="#">End of Life Information</a>
Take-back	No

Dimensions Drawings

Dimensions

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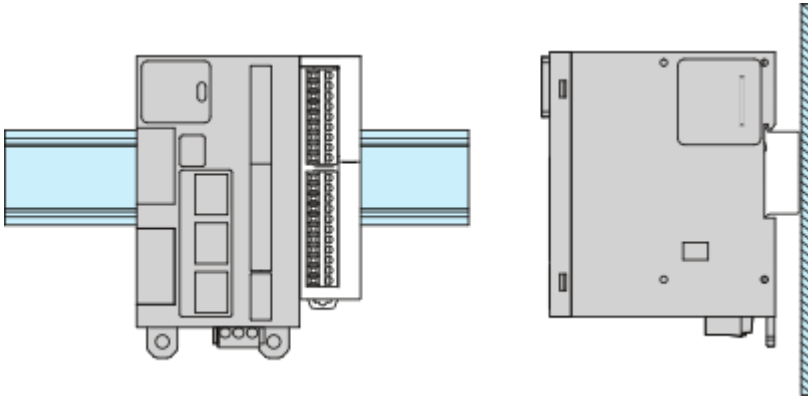


Mounting and Clearance

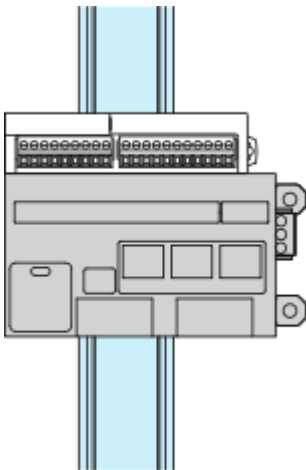
Mounting Positions

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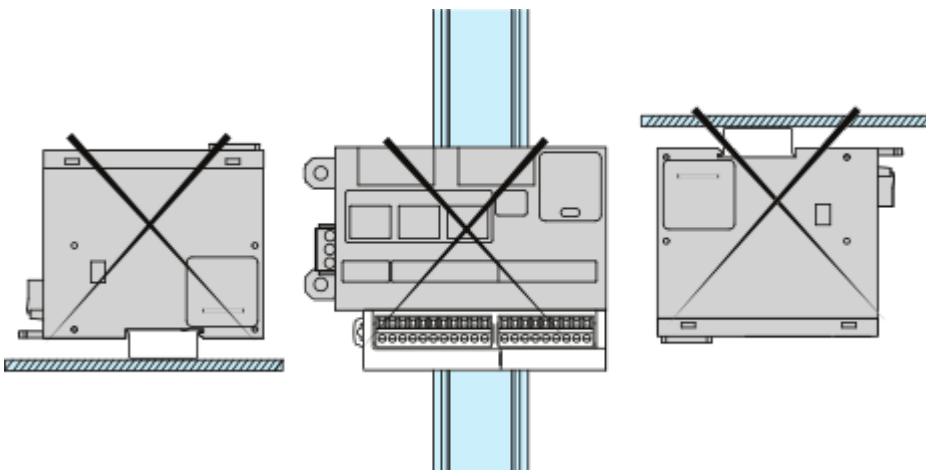
Correct Mounting Position



Acceptable Mounting Position



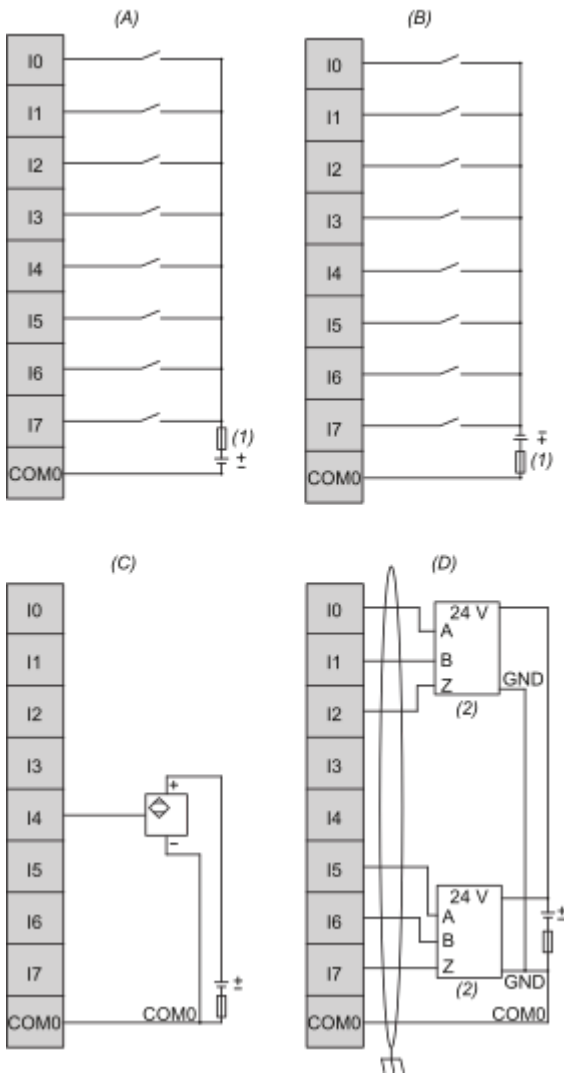
Incorrect Mounting Positions



Connections and Schema

Wiring Diagrams

Digital Inputs



(1) : Type T fuse 0.1 A

(2) : Encoder

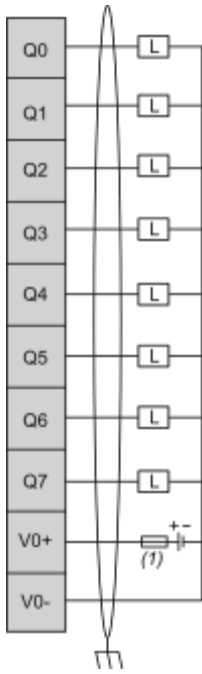
(A) : 2-wire Sink input

(B) : 2-wire Source input

(C) : 3-wire input

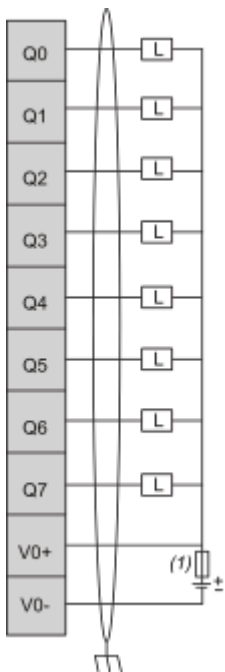
(D) : 24 Vdc incremental encoder with push-pull at outputs

Digital Outputs Source Wiring



(1) : Type T fuse 3.2 A

**Digital Outputs Sink Wiring**

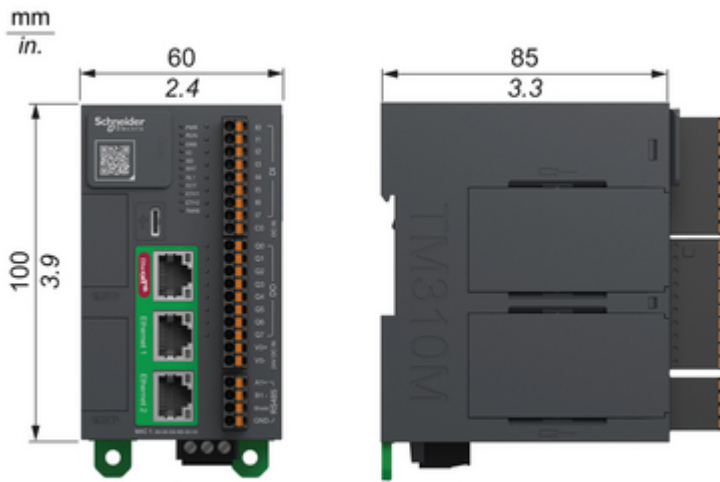


(1) : Type T fuse 3.2 A

Technical Illustration

Dimensions

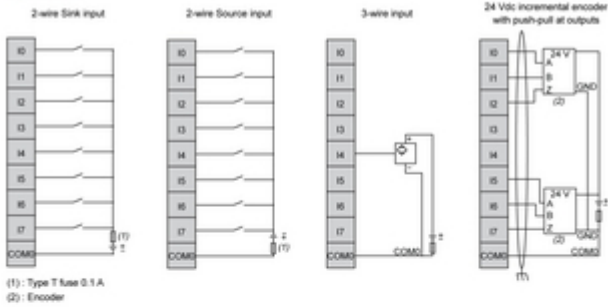
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Technical Illustration

Wiring diagram

Digital Inputs



Digital Outputs Source Wiring

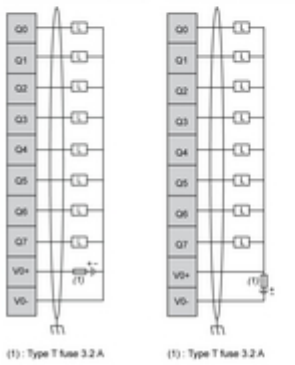


Image of product / Alternate images

Alternative

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